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CHILDREN'S FOOD INSECURITY IN COHABITING, MARRIED AND SINGLE-MOTHER HOUSEHOLDS.

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ABSTRACT

This study uses multiple years of the Current Population Survey Food Security Supplement (N=48,197 households) to examine the relationship between family structure and two measures of child food insecurity: marginal child food security and low child food security. Results demonstrate that children growing up in complex family households are more vulnerable to food insecurity, on average, than children growing up in two biological married parent households. Regression analyses indicate that both the biological relationship of the parent to the child and the marital status of the parent matters in protecting children from exposure to child focused food insecurity, but this relationship varies across race/ethnic groups.

KEY WORDS: Food Insecurity, Family Structure, Race/Ethnicity

1. Introduction

Food insecurity—the lack of consistent access to adequate amounts of food—remains a reality of many low-income American families. Among U.S. households with children in 2013, 20% were food insecure, reporting that they were uncertain of having, or unable to acquire, enough food to meet the needs of all members. This is not a recent phenomenon, the rates of food insecurity in the U.S. have been rising since 2000 spiking with the onset of the Great Recession in 2008, and have remained essentially unchanged since then. While children are usually protected from substantial reductions in food intake in food insecure households, nearly 10% (3.8 million households) included children who experienced low food security (defined by the USDA as having their food intake reduced and their normal eating patterns disrupted) because their household lacked money and other resources for food in the last 12 months (Coleman-Jensen, Gregory and Singh 2014). It is well established that inadequate financial resources are tied to food insecurity (e.g., Bickel, Nord, Hamilton and Cook 2000; Nord, Andrews, and Carlson 2009), but food insecurity is not solely about economic resources. The current study moves beyond a singular focus on income and considers how the family context may protect or generate risk for children.

American family life has become more complex. Children increasingly experience single parenthood, divorce, cohabitation, and re-partnering (Cherlin 2010). Indeed, roughly 40% of U.S. children are expected to reside in a cohabiting family by age 12 (Kennedy and Bumpass 2008). A large body of literature documents the association between living in increasingly non-traditional households (those not composed of two married, biological parents) and children's health and behavioral outcomes. However, the extant research on food insecurity and family structure is limited and the findings are mixed. Some studies find that non-intact families are linked to a higher incidence of food insecurity at the household level (e.g., Manning & Brown 2006, Asc and Nelson 2002), while others find no clear patterns of association between food insecurity and family

structure once socioeconomic and demographic characteristics are accounted for (Miller, Nepomnyaschy, Ibarra and Garasky 2014). Given the increasing complexity of families in the U.S., combined with sustained high levels of food insecurity during the last decade, a closer examination of this relationship is warranted.

The current study uses recent (2007-2013) waves of U.S. population-based data to examine the association between complex family structure and child food insecurity. Unlike prior recent work this study accounts for both union status (single, married, cohabiting) and the biological relationship of the child to the adult (biological and step). Two levels of child food insecurity are examined—marginal child food security and low child food security. The extent to which the association between family structure and child food insecurity varies net of socioeconomic characteristics is assessed. In addition, variations by race/ethnicity are also explored.

2. Background

2.1 Significance of child food insecurity

At least 17.5 million or over 14 percent of households were food insecure at some time during 2013 (Coleman-Jensen et al 2015). These households were unable to acquire enough food because they had insufficient money or other resources. Although children are usually protected from reductions in food intake even in households with low food security (McIntyre, Glanville, Raine, et al. 2003), about 10 percent of all households with children (3.8 million households) also experienced reduced food intake and disrupted eating patterns (Coleman-Jensen et al. 2015). Research has linked food insecurity and other measures of food hardship among children to lower levels of general physical health (e.g., Ryu and Bartfeld 2012; Alaimo, Olson , Frongillo, Briefel 2001; Cook, Frank, Levenson et al. 2006; Kirkpatrick, McIntyre, & Potestio 2010; Frank, Casey, Black et al. 2010) and health related quality of life (Casey, Szeto, Lensing et al. 2005) as well as a

variety of poor health outcomes including anemia (Eicher-Miller, Mason, Weaver et al. 2009; Skalicky, Meyers, Adams et al. 2006) and asthma (Kirpatrick et al. 2010). Food insecurity among children has also been associated with delayed academic and cognitive development (Winicki & Jemison 2003; Alaimo, et al. 2001; Howard 2011; Cook & Frank 2008; Jyoti, Frongillo and Jones 2005: Rose-Jacobs, Black, Casey et al. 2008), higher probabilities of anxiety and aggression (Whitaker, Phillips and Orzol 2006; Slopen, Fitzmaurice, Williams & Gilman 2010), as well as increased behavioral problems (Slack & Yoo 2005; Huang, Matta Oshima, & Kim 2010; Slopen et al. 2010).

2.2 Significance of family structure

Much on the research on possible causes of food insecurity among children has focused on economic correlates (e.g., job loss, unstable income), with many studies focusing on the ameliorative effects of food programs (e.g., SNAP, school breakfast and lunch programs, food pantries). Limited research has focused on the relationship between family structure and food hardship (e.g.; Manning et al. 2006; Asc and Nelson 2002), establishing that children residing in single parent or cohabiting families are more likely to experience material hardship such as food insecurity than are children living in married couple families. Indeed, recent estimates provided by the USDA support this pattern. Almost half (48%) of all families experiencing the more severe form of food insecurity—very low food security among children—were headed by a single parent. Interestingly, a sizeable minority (44%) of these households were headed by a married couple (Coleman-Jensen, McFall, and Nord 2013), but it is unclear if these were two biological parent married households. Because rates of remarriage, re-partnering and multiple partner fertility are high (Kennedy & Bumpass 2008; Kreider & Fields 2002; Kreider 2006; Ventura 2009; Raley & Bumpass 2003; Stewart 2007) children are increasingly likely to live in two-parent families in

which they are not the biological children of the mother's new partner (Coleman, Ganong, & Fine 2000; Hogan & Goldscheider 2001; Hofferth 2006).

Recent national published reports on child food insecurity detail family structure from the perspective of the household head and provide estimates contrasting married, cohabiting or single parent households. Food insecurity is highest in single-parent families, followed by cohabiting-parent families with married-parent families having the lowest risk of food insecurity. Using the 1999 National Survey of American Families (NSAF), two studies (Manning et al. 2006; Acs and Nelson 2002) explored the biological and union status of parents finding that families with two biological parents (cohabiting or married) had more protection from household food insecurity than stepfamilies (one biological parent and one non-biological parent). However, these studies use a general and less established measure of household food insecurity that does not focus on children. A recent study (Miller et al. 2014) addresses this shortcoming by utilizing items from the well-validated USDA Food Security Module (FSM) to examine child food insecurity, finding mixed results and no clear pattern of association between child food insecurity and family structure once key economic and demographic factors are controlled for. However, their study does not distinguish between married or cohabiting stepfamilies, it focuses on select age groups of children and draws on data that were collected prior to the start of the Great Recession. Further, to date no research has considered the link between family complexity and child food insecurity for race/ethnic groups.

These are important omissions for several reasons. First, the rates of food insecurity in the U.S. have been rising since 2000 spiking with the onset of the Great Recession in 2008, and have remained essentially unchanged since then (Coleman-Jensen et al 2013). It may be that the relationship between complex family structure and child food insecurity has shifted under the

economic constraints experienced by U.S. households during the last decade. Second, prior research has shown that the relationship between family structure and multiple measures of child well-being is more pronounced for non-Hispanic white children than it is for either black or Hispanic children (e.g., Manning et al. 2006; Dunifon and Kowaleski-Jones 2002). Further, children in complex families are more often minority than white. Indeed, cohabitation has become especially prominent in the lives of black and Hispanic children. About half (54%) of black children, and 43% of Hispanic children are expected to live in a cohabiting household at some point compared to roughly a third (35%) of white children (Brown, Manning and Stykes 2014). An exploration of possible race/ethnic differences in the association between child food insecurity and family structure may provide information to help address the persistent and significant health disparities that exist among racial and ethnic minorities, a key goal of Healthy People 2020 (Koh 2010). And finally, recent research has demonstrated that family-type categorization depends on the unit of analysis (Brown and Manning 2009). One child's lens on family relationships excludes the experience of the entire household. For example, one child in the family may be living with both biological parents while another is living with a biological mother and a stepfather or cohabiting partner. By limiting the definition of family structure to the perspective of just one child in the household, the full relationship between more complex family structure and child food security may be understated.

3. The present study

It is important to consider the relationship between more complex family structures (i.e., step families, cohabiting families) and patterns of child food insecurity because there is some evidence that household resources are allocated to children differently based on family type (Case et al 1999; Evenhouse and Reilly 2004; Anderson, Kaplan and Lancaster 2001). For example,

research by Case, Lin and McLanahan (1999) found that children in stepfamilies are at greater risk by receiving fewer food allocations than are children in biological families. In addition, cohabiting families have been found to spend less on children, are less likely to share their income or invest in joint households goods than are married couple families (Deleire and Kalil 2002; Waldfogel, Craigie and Brooks-Gunn 2010). Indeed, children in cohabiting step households may face "double-institutional" jeopardy because of the lack of both marital and biological ties (Manning, Smock and Bergstrom-Lynch 2009). In the current study, family structure is considered from the perspective of all children residing in the household. The consideration of the relationship between just one child and the household head or parent may indicate that the household is a 100% intact or biological family but taken from multiple children's perspective, that family may be categorized as a stepfamily. As described above, children living in the same family could live in different family structures.

The 'cohabitation and parent pointers' on the Current Population Survey-Food Security Supplement (FSS)—which identifies the spouse or cohabiting partner of each adult in the household, and establishes the type of parent for each child (biological parent, step parent, adopted parent)—provides the opportunity to analyze the prevalence and depth of child food insecurity with a more refined measure of family structure and well-established measures of child food insecurity. Of particular interest to this study are the patterns of child food security in stepfamily households, distinguishing between married and cohabiting households. Given that only 59% of children live in stable two biological married families (Payne 2013), and fewer than half (48%) of low income children live in a married parent household (Addy, Engelhardt and Skinner 2013), the current study offers a significant contribution to understanding the well-being of children who are not reared solely by their biological parents.

3.1. Cohabiting Parent Households (Step vs. Biological).

Distinguishing between cohabiting two biological parent households and cohabiting stepparent households is important because prior research finds that children in stepfamilies experience more instability (Stewart 2001) and receive less economic support than children in biological families (e.g., Case, et al. 2000; Case and Paxton 2001). On the other hand, children living in cohabiting stepparent households may fare better than children living with cohabiting biological parents. Single mothers with children may choose cohabiting partners that have more economic and social resources and therefore be better able to prevent food insecurity among children (Bzostek, McLanahan and Carlson 2012). A comparison of child food insecurity is made between children living in cohabiting biological parent households to children living in cohabiting stepfamily households to establish whether it is important to distinguish between these two cohabiting family types.

3.2. Biological Parent Households (Cohabiting versus Married).

On average, children in two biological parent married families tend to have the best outcomes on a host of measures ranging from physical (Ziol-Guest and Dunifon 2014; Bramlett and Blumberg 2007) and emotional health (e.g., Brown 2006; McLanahan and Sandefur 1994) to economic well-being (Manning and Lichter 1996). Prior research using a broad measure of households food hardship, finds that two biological parent cohabiting families are just as likely to experience food hardship as those in two biological parent married families (Manning et al. 2006). By using a well-validated child-focused measure of food insecurity, the current study can explore whether marriage serves as a protection against food insecurity among children.

3.3. Stepfamily Households (Married versus Cohabiting).

Compared to married households, cohabiting households are less stable (Manning,

Smock and Majumdar 2004). Marriage provides the socioeconomic benefits and stability that cohabitation does not offer. Prior studies find that weaker ties and less stable qualities of cohabiting unions may lead to fewer joint investments by cohabiting than married couples (Brines and Joyner 1999; Kalmijn, Loeve, and Manting 2007). As a result, children in cohabiting stepfamilies may not receive as much protection from food insecurity as children living in married stepfamilies.

3.4. Single Mother Households (Single Mother versus All Family Types).

Published USDA reports of food insecurity consistently show that single mother households are the most at risk for food insecurity. Cohabitation may benefit children when contrasted with single-mother families—either through the extra economic resources brought to the household or through the added social networks (i.e., family and friends) that may help avoid food insecurity. On the other hand, the presences of a cohabiting partner may be a liability if they consume more resources than they contribute.

4. Methods

4.1 Data and sample

Data come from multiple years of the Current Population Survey, Food Security Supplement (FSS). The FSS includes a wide range of questions on food-related problems, perceived dietary inadequacy, reductions in food intake and frequency of hunger. These data are particularly well suited for studying food security in children because it is the only large, recently collected, national-level dataset that allows for the exploration of an important but relatively uncommon phenomenon (In 2013 just 10% of US households with children, one or more children experienced low food security (Coleman-Jensen 2015)). For the analysis, data from 2007 through 2013 are pooled, excluding any households surveyed twice due to the 4-8-4

sampling structure of the CPS. The analytic sample is composed of households with children ages 0 to 17 with child food security information and household composition from the child perspective attached. The sample includes only households in which there is a biological mother of at least one child and excludes all other households. In addition, households are excluded in which children are identified as the household head, the spouse or cohabiting partner of the household head. The final analytic sample includes 48,197 households with valid child food security and family structure information.

4.2 Measures

4.2.1 Child Food Insecurity

The USDA differentiates food-secure households by the severity of food insecurity they have experienced in the last 12 months. Food insecurity in households with children is further differentiated by whether it affects only adults or also affects children and by the severity of food insecurity among the children (Coleman-Jensen et al. 2013). The following questions constitute the eight items from the USDA's 18-item food security scale that are used to identify food insecurity among children: (1) We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food; (2) We couldn't feed our children a balanced meal, because we couldn't afford that; (3)The children were not eating enough because we just couldn't afford enough food; (4) In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food?; (5) In the last 12 months, were the children ever hungry but you just couldn't afford more food?; (6) In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food?; (7) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months? And (8) In the last 12 months, did any of the children ever not eat for a whole day because there

wasn't enough money for food? Responses for questions 1-3 ranged from often, sometimes, or never true. The questions were coded as affirmative if the response was 'often' or 'sometimes'. Question 7 responses ranged from almost every month, some months but not every month, or in only the last two months. This question was coded as affirmative if the response was 'almost every month' or 'some months but not every month.' The remaining questions were Yes/No and coded as affirmative if the response was 'Yes'.

The two dependent variables are categories of child food security status based on the number of affirmative responses to the USDA Food Security Scale child-specific questions: a dichotomous indicator of marginal child food security (1 or more affirmative responses), hereafter known as *MCFS*, and *child food insecurity* or *CFI* among children (2 or more affirmative responses). It is important to consider the measure of MCFS (1 or more responses) along with the measure of CFI typically published in USDA reports because emerging research shows that experiencing even marginal food security among children is associated with poor health and nutritional outcomes (Cook, Black, Chilton et al. 2013).

4.2.2 Family structure.

Prior research on food security among children has typically measured family structure based on the current marital status of the household head (i.e. married couple, single mother), or the presence of an unmarried partner (cohabiting household) which ignores stepfamilies. An exception is Miller et al. (2014) which considers a re-partnered mother as a stepfamily but does not distinguish union type (i.e., married or cohabiting). This is an important shortcoming because there is evidence to suggest that marriage confers benefits and transmission of economic resources which may not occur in cohabiting stepfamilies (Brown 2010).

The cohabitation and parent pointers included in the CPS (beginning 2007) enable a more complete depiction of family structure from the perspective of the children. For example, children living with a mother and a step-father would have been previously identified as simply a married couple household, rather than a stepfamily. To identify family structure from the perspective of the child several steps were taken. First, a child level file was constructed which includes information on each person identified as a mother or father (i.e., identifying line number, type of parent, identifying number for parent's spouse/cohabiting partner, etc.). It is relatively straightforward to consider the combination of parents for only one child (e.g., two biological parents, one biological parent and one step parent, only one parent), but for households with more than one child it is necessary to examine the full range of family structures experienced by all children in the household. For example, one child may be residing with two biological parents but another child in the same family may be residing with his or her biological mother and stepfather. In households with more than one child, it was determined whether each child shares not only the same mother and/or the same father, but also whether each child shares the same parent type (i.e., step or biological). [For the purposes of this analysis adoptive parents are combined with biological parents]. The majority of children reside in primary families, that is, in families in which there are just one father and/or one mother.

To establish family structure categories it was necessary to establish a list of criterion for inclusion in distinct categories. When each child in the household shares the same two biological parents that are married to each other the household is termed a *married biological parent household*; those biological parent households in which the parents are unmarried are termed *cohabiting biological parent households.* Children are living in a *married stepfamily household* when at least one child in the household has an identified married stepparent; when the identified

stepparent is not married to the other parent, the family is classified as a *cohabiting stepfamily household.* Following Manning and Brown (2011), households are also *cohabiting stepfamily households* when children have an unmarried mother who reports residing with a cohabiting partner. The final category of child-focused family structure includes *single mother households*. This includes households in which children have a mother who does not have a cohabiting partner nor a spouse listed on the household roster. It is important to note, that households are included in the sample that have one identified mother. Households that have no mother (i.e., single father households, no parent households) or more than one mother (i.e., multifamily) are excluded from the analysis.

4.2.3. Control variables

The models control for a series of sociodemographic variables used in recent research on child food insecurity and family structure, that are likely to be associated with family structure and child food insecurity. Since the file is a household level file, the characteristics are taken from the household head. These include the race/ethnicity of the (defined as non-Hispanic white (hereafter white), non-Hispanic black (hereafter black), other non-Hispanic (hereafter other) and Hispanic), educational attainment (defined as less than high school, high school, and more than high school), and age. Also included are number of children and the number of adults in the household. The FSS includes a two-category measure of household income-to-poverty ratio defined as 1) below 185% of the federal poverty level (FPL) or 2) at or above 185% or income missing. Using missing data flags, I create a three category variable of 1) below 185% FPL, 2) above 185% FPL) and 3) income missing.

4.3 Analytic plan

The goal of this study is compare and contrast the patterns of child food insecurity in biological married, biological cohabiting, married step, cohabiting step and single mother families. Given the binary dependent variables, logistic regression is used to model any child food insecurity (versus fully food secure) and low child food security (versus marginally or fully food secure). Initial models establish the bivariate relationship between family structure and child food insecurity. Full models incorporate socioeconomic characteristics of the household to evaluate the extent to which family structure variation in child food security is a function of these factors. The analysis proceeds in four steps.

First, each family structure is contrasted with households headed by two biological married parents. I begin with this question because 59% of children in the U.S. lived with two married biological parents in 2013 (Payne 2013), and most research on family structure contrasts how children in specific family structures fare compared with children living in married two biological parent households. Next, to understand the linkages between complex family structure and child food insecurity, four key comparisons are made between the following family types: (1) cohabiting parent households (i.e., two biological parents vs. stepfamily), (2) two biological parent households (i.e., married vs cohabiting), (3) stepparent households (i.e., married vs. cohabiting), and (4) single mother households (unpartnered mother vs. cohabiting stepfamily). To understand if family structure and race/ethnicity significantly interact in their relationships with child food security, parallel models stratified by race/ethnicity are also presented.

5. Results

5.1 Descriptive Results

Table 1 shows that children's food security as well as households characteristics vary by family type. Overall, cohabiting step and single mother households show the highest prevalence of food insecurity among children, followed by cohabiting biological households and married step households. The presence of *MCFS* (responding affirmatively to at least one child-focused question of food hardship) varies widely by family type, ranging from 11% in married two biological parent households to 31% in single mother households. Twenty percent of married step households are experiencing any food insecurity among children compared with 31% of cohabiting step households. In cohabiting biological families, almost 20% of children experience some food insecurity. The more extreme measure of *CFI* (responding affirmatively to two or more child-focused questions on the USDA food security scale) follows a similar pattern across family type.

Households with children in cohabiting families are disproportionately black or Hispanic. Just 46% of households with children in cohabiting two biological parent households are white, approximately 16% are black and 32% are Hispanic. In contrast, nearly two-thirds (67%) of children in married biological parent households are white. Among cohabiting stepfamily households, a majority (57%) are white, 14% are black and almost a quarter (24%) are Hispanic. In addition, cohabiting families have household heads with lower levels of education. Almost a quarter (23%) of household heads in cohabiting biological parent households and 20% in cohabiting stepfamily households have less than a high school degree; yet, only 9% of heads of married biological parent households have low levels of education. Cohabiting parent households—both biological and step—as well as single mother households are also more likely to reside in households with income that places them below 185% of the federal poverty line than biological parent households.

TABLE 1: CHARACTERISTICS OF HOUSEHOLDS WITH CHILDREN BY FAMILY STRUCTURE

	Married Biological	Married Step	Cohabiting Biological	Cohabiting Step	Single Mother
Child Food Security Status					
Marginal Child Food Security (MCFS)	0.110	0.198	0.235	0.306	0.307
	(.002)	(.007)	(.014)	(.015)	(.005)
Low Child Food Security (CFI)	0.055	0.105	0.111	0.166	0.178
	(.002)	(.006)	(.01)	(.012)	(.004)
Characteristics of HH Head					
Non-Hispanic White	0.670	0.656	0.460	0.565	0.449
	(.003)	(.009)	(.016)	(.016)	(.005)
Non-Hispanic Black	0.069	0.119	0.155	0.141	0.291
	(.002)	(.006)	(.012)	(.012)	(.005)
Non-Hispanic Other	0.089	0.053	0.063	0.052	0.050
	(.002)	(.004)	(.007)	(.007)	(.002)
Hispanic (any race)	0.172	0.172	0.323	0.242	0.211
	(.003)	(.007)	(.015)	(.014)	(.005)
Age (in years)	40.6	39.0	31.5	35.0	39.6
	(.062)	(.176)	(.29)	(.287)	(.135)
Less than High School	0.090	0.114	0.228	0.197	0.163
	(.002)	(.006)	(.014)	(.013)	(.004)
High School	0.223	0.300	0.363	0.366	0.304
	(.003)	(.008)	(.015)	(.015)	(.005)
More than High School	0.687	0.585	0.409	0.437	0.533
	(.003)	(.009)	(.016)	(.016)	(.005)
Number of Children	1.879	2.303	1.555	2.557	1.728
	(.006)	(.021)	(.027)	(.032)	(.011)
Number of Adults	2.292	2.319	2.254	2.203	1.627
	(.004)	(.013)	(.021)	(.017)	(.01)
Income to Poverty Ratio					
Under 185% FPL	0.244	0.387	0.565	0.602	0.561
	(.003)	(.009)	(.016)	(.016)	(.005)
At or above 185% FPL	0.564	0.447	0.266	0.237	0.247
	(.003)	(.009)	(.014)	(.013)	(.004)
Missing Income	0.193	0.166	0.169	0.161	0.192
	(.003)	(.008)	(.013)	(.013)	(.005)
Unweighted N	30,351	3,934	1,335	1,334	11,179

Note: Means (standard error) are weighted with FSS household supplement weights.
Pooled CPS-FSS 2007-2013.
"Marginal Child Food Security" is defined as reporting at least 1 affirmative response to child specific food security questions.
"Low Child Food Security" is defined as reporting two or more affirmative responses to child specific food security questions.

5.2 Multivariate logistic regression models

Table 2 presents the logistic regression models predicting any food insecurity (MCFS), (Models 1 and 2) and low child food security (CFI) (Models 3 and 4) by family type. For each outcome, the initial model includes only family structure and the full model includes the set of demographic and socioeconomic controls along with a set of year fixed effects. The multivariate results are presented according to substantive family structure comparisons. To make statistical comparisons between other family categories, the reference categories are switched. Significant differences between key groups of interest are indicated by superscripts. In addition, Table 4 presents the results of post estimation tests for the coefficients in Table 2.

As found in most prior studies on children's health and well-being, the unadjusted predicted odds of children's food insecurity is higher in cohabiting, step- and single mother households compared to children living in two biological married parent households (Models 1 and 3). The relationship is somewhat attenuated with the inclusion of key socioeconomic and demographic characteristics, but remains significant. Among children living in two biological parent households, those with cohabiting parents experience significantly higher predicted odds of any child food insecurity compared to children living with married parents. More specifically, children residing within a cohabiting biological parent household have 34% ($100 * [e^{.30} - 1]$) higher predicted odds of experiencing CFI than children residing within a married biological parent household (Table 2, Model 4). Children in married stepfamily households face 53% higher predicted odds, children in cohabiting stepfamily households face 86% higher odds, and children in single parent households face 113% higher predicted odds of experiencing CFI, on average, than children residing in biological married family households. Overall, children in biological married parent households have increased protection from child food insecurity.

TABLE 2: LOGISTIC REGRESSION MODELS PREDICTING CHILD FOOD INSECURITY AMONG HOUSEHOLDS WITH CHILDREN (UNSTANDARDIZED COEFFICIENTS)

	MCFS		CFI	
	Model 1	Model 2	Model 3	Model 4
Family structure				
Cohabiting Biological	0.91 ***a	0.39 ***a	0.77 ***a	0.30 **a
Married Stepfamily	0.70 ***b	0.42 ***b	0.71 ***b	0.42 ***
Cohabiting Stepfamily	1.27 ***	0.63 ***	1.24 ***	0.62 ***
Single Mother	1.28 ***	0.75 ***	1.32 ***	0.76 ***
(Married Biological)				
Characteristics of the Household Head				
Age		0.00		0.01 ***
Race/ethnicity				
Non-Hispanic Black		0.25 ***		0.27 ***
Hispanic		0.27 ***		0.32 ***
Non-Hispanic Other		0.00		0.20 *
(non-Hispanic white)				
Educational Attainment				
High School		-0.22 ***		-0.20 **
More than High School		-0.50 ***		-0.48 ***
(Less than High School)				
Household Characteristics				
Total Children in HH		0.14 ***		0.14 ***
Total Adults in HH		-0.09 ***		-0.11 ***
Income to Poverty Ratio				
185% or Higher		-1.59 ***		-1.64 ***
Missing income		-1.09 ***		-1.01 ***
(HH below 185% FPL)				
Constant	-2.09 ***	-1.29 ***	-2.85 ***	-2.36 ***
Wald X^2	1739.7	4755.3	1079.28	2679.57
Df	4	20	4	20

*Note: N=48,197. # p <.10 * p<.05. ** p<.01. *** p<.001.* Models 2 and 4 also contain year fixed effects.

a. Difference between cohabiting biological household and cohabiting step household statistically significant at least to p<.05

b. Difference between cohabiting stepparent household and married stepparent household statistically significant at least to p<.05

c. Difference between single mother household and cohabiting step household statistically significant at least to p<.05

MCFS is defined as reporting at least 1 affirmative response to child specific food security questions.

CFI is defined as reporting two or more affirmative responses to child specific food security questions.

If we address the biological relationship of the children to the parents among just cohabiting households we see an advantage among 100% biological households. For both outcomes, MCFS and the more severe CFI, children living in a cohabiting stepfamily households have 28% higher odds of MCFS ($e^{(.63 - .39)} = 1.28$ p <.03) and 38% higher odds of experiencing CFI ($e^{(.62 - .30)} = 1.38$ p <.02) than children living in a biological cohabiting parent household. (Significant differences between cohabiting biological and cohabiting stepparent households are denoted in Table 2 with the superscript a). Mirroring the bivariate findings, these results suggest a protective advantage of living with two biological parents among children who live with cohabiting parents.

Turning to children living in stepfamily households, those living in married stepfamily households appear to experience more protection from marginal child food insecurity, on average, than children living in cohabiting stepfamily households. Statistically significant differences in the food security of children living in cohabiting stepfamilies versus married stepfamilies are denoted with the superscript b. For example, the predicted odds of MCFS is 24% (100* [$e^{(.63-.42)}$ -1]) higher among cohabiting stepfamily households compared to married stepfamily households. The pattern is similar in the full model for CFI (Table 2, Model 4), but the difference between married and cohabiting stepfamily households fails to reach more than marginal significance ($e^{(.62-.42)}$, p <.07).

And finally, children in households with single mothers have higher unadjusted and adjusted odds of experiencing MCFS or CFI than children living in all other family forms, with one exception. In both the bivariate and full models, there are no statistically significant differences in the predicted odds of experiencing MCFS ($e^{(.75 -.63)} = 1.12$, p=.162) or experiencing CFI ($e^{(.76 -.62)} = 1.12$, p=.208) between children living in a single mother household

or children living in a cohabiting stepfamily household. In other words, the likelihood of child food insecurity is the same for children living in households where the mother is unpartnered or in households where the mother is living with an unmarried partner.

5.3 Race/ethnic specific multivariate logistic regression models.

Models that simply control for race and ethnic groups may be masking important differences in the association between family structure and child food insecurity. There is considerable variation in the levels of child food insecurity and family structure by race/ethnicity (Appendix). Whereas one out of eight (13%) white households with children experience MCFS or any child food insecurity, roughly twice as many black (27%) or Hispanic (27%) households do so. The more severe form of CFI follows similar patterns. Models 2 and 4 were repeated with a sample restricted to the three largest race/ethnic groups: white, black and Hispanic households. Interactions between race and family structure yielded significant effects and an improved model fit (results not shown). Therefore, Table 3 presents the bivariate models (Models 1 and 3) and the multivariate models (Models 2 and 4) for both levels of child food insecurity separately by race/ethnicity. For ease of presentation, the coefficients for the sociodemographic characteristics in the full models are not shown in the table. To make statistical comparisons between other family categories, the reference categories are switched. Key comparisons are highlighted with superscripts, while Table 4 presents the results of post estimation tests for the coefficients in Table 3.

5.3.1 Do children living in a married two biological parent household all have the same protective advantage against food insecurity?

Combining all households with children together masks several race and ethnic group differences. Specifically, white children living in married two biological parent households

TABLE 3, CONTINUED: LOGISTIC REGRESSION MODELS PREDICTING CHILD FOOD SECURITY BY RACE AND ETHNIC GROUP (UNSTANDARDIZED COEFFICIENTS)

	MCFS		CFI	
	Model 1	Model 2	Model 3	Model 4
Non-Hispanic White Households (*N* =32,185)				
Family structure				
Cohabiting Biological	1.12 ***a	0.53 ***	0.97 ***a	0.45 *
Married Stepfamily	0.94 ***b	0.59 ***	1.06 ***b	0.69 ***
Cohabiting Stepfamily	1.48 ***	0.70 ***c	1.43 ***	0.64 ***c
Single Mother	1.52 ***	1.02 ***	1.69 ***	1.10 ***
(Married Biological)				
Wald X^2	1271.2	3081.93	828.64	1955.73
Df	4	17	4	17
Non-Hispanic Black Households (*N* =4,939)				
Family structure				
Cohabiting Biological	0.40 a	0.18	-0.09 a	-0.28 a
Married Stepfamily	0.32 *b	0.03 b	0.23 b	-0.06
Cohabiting Stepfamily	1.12 ***	0.60 **	0.99 ***	0.53 *
Single Mother	0.92 ***	0.53 ***	0.79 ***	0.39 **
(Married Biological)				
Wald X^2	124.42	352.94	64.83	229.46
Df	4	17	4	17

TABLE 3, CONTINUED: LOGISTIC REGRESSION MODELS PREDICTING CHILD FOOD SECURITY BY RACE AND ETHNIC GROUP (UNSTANDARDIZED COEFFICIENTS)

	MCFS		CFI	
	Model 1	Model 2	Model 3	Model 4
Hispanic Households (*N* =7,476)				
Family structure				
Cohabiting Biological	0.28 *a	0.17	0.26 a	0.18
Married Stepfamily	0.23 *b	0.10	0.22 b	0.09 b
Cohabiting Stepfamily	0.65 ***	0.43 **	0.77 ***	0.58 **
Single Mother	0.55 ***	0.34 ***	0.59 ***	0.42 ***
(Married Biological)				
Wald X^2	82.02	543.56	66.900	344.96
Df	4	17	4	17

Models 1 and 3 contain only family structure. Models 2 and 4 includes controls for householder age, education, household income to poverty ratio, number of adults and children and year fixed effects.

MCFS is defined as reporting at least 1 affirmative response to child specific food security questions.

CFI is defined as reporting two or more affirmative responses to child specific food security questions.

*# p <.10 * p<.05. ** p<.01. *** p<.001.*

a. Difference between cohabiting biological household and cohabiting step household statistically significant at least to p<.05

b. Difference between cohabiting stepparent household and married stepparent household statistically significant at least to p<.05

c. Difference between single mother household and cohabiting step household statistically significant at least to p<.05

consistently have a protective advantage against each level of child food insecurity and over each family type examined here. The same patterns are not found among Black and Hispanic households: with few exceptions, cohabiting biological parent and married stepfamily households appear to offer the same protection against CFI, on average, as do married biological parent households, while cohabiting step households and single mother households remain significantly more likely to experience each level of child food insecurity than married biological parent households.

5.3.2. Do all children in cohabiting stepfamily households have similar levels of child food insecurity as children living in cohabiting biological parent households?

The relationship between cohabiting households and MCFS or CFI differs according to the race/ethnic group and biological status of the parents. In the zero-order models, all children (regardless of race/ethnicity) residing in cohabiting biological parent households have lower odds of experiencing MCFS or CFI than children living in cohabiting stepfamily households (Table 3, Models 1 and 3). [Statistically significant differences between cohabiting biological households and cohabiting step households in Table 3 are indicated by the superscript a). In the multivariate models the patterns change. White children living in cohabiting stepparent and cohabiting biological parent households have similar risk of MCFS and CFI once sociodemographic characteristics are accounted for. Among black families, children living in cohabiting stepparent households have 123% ($100*[e^{(.53- -.28)} -1]$, $p<.035$) higher odds of experiencing CFI than children living in cohabiting biological parent households. This is in line with similar findings in Manning et al. (2006) using a less detailed food security measure. Among children living in cohabiting parent households, black children are more likely to be food secure when living with biological parents than with stepparents.

The findings for Hispanic children living in cohabiting family households largely mirror those of white children. The bivariate relationship suggests that children are more likely to experience some level of child food insecurity but the relationship disappears once socioeconomic factors are included in the full models. The biological status of the parents appears not to be associated with the food security of children living in a Hispanic household with cohabiting parents.

5.3.3. Do all children experience the same protection from food insecurity by living in a married stepfamily household rather than a cohabiting stepfamily household?

Next, race/ethnic differences in MCFS and CFI are examined for households with children living with cohabiting versus married stepparents. In Table 3, significant differences between married and cohabiting stepfamilies are denoted with the superscript b. Among white households, children living in cohabiting stepparent households have similar predicted odds of having MCFS or CFI only in the zero-order models. Any association is accounted for once controls are added to the models. In contrast, among black and Hispanic stepparent households, children have higher predicted odds of food insecurity in cohabiting rather than married households. For example, among black stepparent households, children residing with cohabiting parents have 74% (100 * [$e^{(.60\ -.03)}$ – 1]) higher odds of experiencing MCFS than children residing in married stepparent households. However, this relationship reaches only marginal significance (p <.06) when examining CFI (Model 4, Table 3). Among Hispanic households, marriage is marginally protective among stepfamilies when considering MCFS ($e^{(.43\text{-}10)}$, p <.06). However, on average, children in Hispanic cohabiting stepparent households have 64% (100 * [$e^{(.58\ -.09)}$ – 1]) higher odds of experiencing CFI than children in Hispanic married stepparent households, net of socioeconomic characteristics.

TABLE 4: RESULTS OF POST-HOC COMPARISONS BETWEEN FAMILY STRUCTURE CATEGORIES.

	TOTAL[1]		WHITE[2]		BLACK[2]		HISPANIC[2]	
	MCFS	CFI	MCFS	CFI	MCFS	CFI	MCFS	CFI
Married Biological Household vs.								
Cohabiting Biological	>	>	>	>	=	=	=	=
Married Step	>	>	>	>	=	=	=	=
Cohabiting Step	>	>	>	>	>	>	>	>
Single Mother	>	>	>	>	>	>	>	>
Cohabiting Biological Household vs.								
Married Step	=	=	=	=	=	=	=	=
Cohabiting Step	>	>	=	=	=	>	=	=
Single Mother	>	>	>	>	=	>	=	=
Married Step Household vs.								
Cohabiting Step	>	=	=	=	>	=	=	>
Single Mother	>	>	>	>	>	>	>	>
Cohabiting Step vs.								
Single Mother	=	=	>	>	=	=	=	=

[1] Results from Models 2 and 4 in Table 2.

[2] Results from Models 2 and 4 in Table 3.

A ">" indicates that the adjusted predicted odds of the outcome is significantly higher ($p > .05$) than the contrast group.

A "=" indicates that the adjusted predicted odds of the outcome is not significantly different from than the contrast group.

5.3.4. Do all children residing in a household with a cohabiting mother fare better or worse than children living in a household with a single mother?

The earlier models (Table 2) suggested that, overall, single mother households consistently have higher odds of both MCFS and CFI compared to other family types with the exception of cohabiting stepfamily households. However, there is variation in this relationship across race and ethnic groups. For example, among whites, single mother households have 35% (100* [$e^{(1.02-.70)}$-1]) higher odds of experiencing MCFS (Table 3, Model 2) and 51% (100* [$e^{(1.10-.64)}$-1]) higher odds of experiencing CFI (Table 3, Model 4) compared with children living in cohabiting stepfamily households. Among black and Hispanic households this relationship is not apparent in either the bivariate or full models suggesting that there is no protective advantage of a cohabiting partner.

Taken together, these findings reveal race and ethnic group variation in the linkages between family structure and child food insecurity. Combining all households with children together masks several race and ethnic group differences. Specifically, white children living in married two biological parent households consistently have a protective advantage against each level of child food insecurity and over each family type examined here. The same patterns are not found among Black and Hispanic households. Further, additional testing shows that white single mother households have significantly higher predicted odds of child food insecurity, on average, than each household structure presented here (Table 4). The same is not true for black or Hispanic households with children. In contrast to white households, there are no statistically significant differences found in the odds of experiencing MCFS or CFI between single mother households and cohabiting stepfamily households.

6. Conclusions

Little research to date has considered the association between increasingly-complex family structures and child food insecurity. Studies that have explored the linkages between complex family type and food insecurity are based on data collected prior to the start of the Great Recession, focus on a limited age range of children, are unable to distinguish between married and cohabiting stepfamilies, derive family structure from the household head or from one child, or do not focus on child food insecurity. This study fills a gap by utilizing recent nationally representative data and a USDA measure of child food insecurity to understand how children are differentially protected from food insecurity by household family structure derived from the child's perspective. The results presented here suggest that children's food security depends in part on parent's cohabitation status and the biological relationship of children to adults.

Consistent with prior research, the results also show that white children seem to benefit the most from their biological parents' marriage more that Black or Hispanic children. Despite the parallel family structure in biological parent households, white cohabiting households fare worse on both measures of child food insecurity than white married households. Perhaps among white households, cohabiters garner less social and institutional support than their married counterparts (Cherlin 2010), which in turn influences their ability to obtain enough resources to keep their children protected from food insecurity. For both marginal child food security and the more severe measure of child food insecurity, there appears to be little protective advantage of marriage for black or Hispanic children—among biological parent households, married and cohabiting households show the same risk. These differences may be the result of race/ethnic variation in income and education by cohabitation and marital status. For example, educational attainment varies little between cohabiting and married Hispanic household heads, while among white households there is steep variation (Results not shown).

In addition, the results presented here find that overall, single mother households and cohabiting stepfamily households present the same level of risk for children's food insecurity. However, further investigation revealed that this varied by race/ethnicity. Among whites, single mother households are less able to protect their children from food insecurity than cohabiting stepfamily households. The same is not true for black and Hispanic households where single mother and cohabiting stepfamily households share the same level of risk.

6.1 Limitations.

This study has some limitations. First, despite its clear advantages the USDA Food Security Module measures food security among all children in the household, not individual children. This limits the ability to measure variation in food security by relationship to the parents for children living in the same household. In addition, the data are cross-sectional and do not allow any consideration of transitions in family structure or the duration of child food insecurity. Little is known about the long-term effects of household structure on patterns of child food insecurity. In one of the few studies to examine shifts in family structure and food security, Hernandez and Pressler (2013) find that transitioning into a union (from unpartnered to either cohabiting or marital) is associated with an improvement in household level food security for Hispanic and non-Hispanic white young children. The authors also found that maternal union transitions are not related to the household food security status of comparable black households. Additional research is needed to establish the extent to which race/ethnic differences in the relationship between family structure and child food insecurity persist over time. Another limitation concerns the sample restrictions. The current study is limited to households with children in which there is one identified biological mother. Single-father households are excluded, as are more complex families that have no mother present and are headed by

grandparents, family types which often have high rates of food insecurity (Balistreri 2012). While this limitation was necessary to focus the aims of the study and attempt to match prior research which focuses on the relationship between one child and one mother, future research should explore the relationship between other types of complex families and child food insecurity.

6.3 Implications

The results from this study demonstrate that children growing up in complex family households are more vulnerable to food insecurity than children growing up in two biological married parent households. The results also suggest that this relationship varies by race/ethnicity of the householder. If the goals of Healthy People 2020 is to eliminate severe food insecurity among children along with eliminating racial and ethnic disparities in health, special attention must be paid to race/ethnic variation in family household composition and its links to child food insecurity. The key public assistance program geared toward reducing food insecurity and eliminating hunger, the Supplemental Nutrition Assistance Program (SNAP) has a broad definition of eligibility, encompassing all household members that prepare and eat meals together. Even though SNAP has a broad definition that may include family members who are connected in a variety of ways, some individuals are still prohibited from receiving benefits (Meyer and Carlson 2014). For example, households in which the parents have children who reside in other households part of the time (i.e., shared custody) or a cohabiting partner who resides in the household part-time—those individuals would only be eligible for SNAP benefits if they eat at least half their meals with the household (Meyer et al. 2014). Indeed, as families have become more complex they have also become more fluid with children and adults moving across household boundaries for varying levels of time (Seltzer 2000). Further research needs to

determine not only the length of time that family members in complex households live together, but also the movement into and out of food insecurity. Given that stable two-married parent families are in decline, it is imperative that food assistance programs continue to test and develop systems that reduce the risks of child food insecurity associated with the family complexity that results from these types of family types.

APPENDIX A: CHARACTERISTICS OF HOUSEHOLDS WITH CHILDREN BY RACE/ETHNICITY

	White	Black	Hispanic
Child Food Security Status			
Marginal Child Food Security (MCFS)	0.129	0.273	0.267
	(.002)	(.006)	(.005)
Low Child Food Security (CFI)	0.065	0.154	0.149
	(.001)	(.005)	(.004)
Family Structure			
Married Biological	0.691	0.325	0.569
	(.003)	(.007)	(.006)
Married Step	0.078	0.065	0.069
	(.002)	(.004)	(.003)
Cohabiting Biological	0.023	0.036	0.051
	(.001)	(.003)	(.003)
Cohabiting Step	0.025	0.029	0.036
	(.001)	(.002)	(.002)
Single Mother	0.182	0.545	0.275
	(.002)	(.007)	(.005)
Characteristics of HH Head			
Age (in years)	40.49	38.34	37.93
	(.055)	(.162)	(.122)
Less than High School	0.052	0.123	0.346
	(.001)	(.005)	(.006)
High School	0.241	0.315	0.292
	(.002)	(.007)	(.005)
More than High School	0.708	0.562	0.361
	(.003)	(.007)	(.006)
Number of Children	1.85	1.93	2.02
	0.01	0.02	0.01
Number of Adults	2.12	1.87	2.25
	0.00	0.01	0.01
Income to Poverty Ratio			
Under 185% FPL	0.257	0.511	0.567
	(.002)	(.007)	(.006)
At or above 185% FPL	0.561	0.272	0.243
	(.003)	(.006)	(.005)
Missing Income	0.182	0.217	0.190
	(.002)	(.006)	(.005)
Unweighted N	32,185	4,939	7,476

Note: Means (standard error) are weighted with FSS household supplement weights. Pooled CPS-FSS 2007-2013.

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